Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of

Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions	ET Docket No. 12-268

Via the ECFS

COMMENTS OF SILVER SPRING NETWORKS

1. Silver Spring Networks is the leader in the networking technologies that modernize today's power grid. Through partnerships with major utilities worldwide, more than 12 million homes and businesses rely on our platform, software and services to improve their energy management and efficiency. Silver Spring Networks securely connects consumers and utility providers through powerful and proven energy networks that are safe and can be easily expanded as needs evolve.
2. Our open, standards-based networking solutions enable all energy devices, from in-home energy devices to smart meters to load control devices, to connect together to deliver the highest performance possible. By connecting homes and businesses directly with their local utility, we help everyone manage and integrate renewable energy sources better, resulting in greater energy efficiency to the planet and our world.
3. Silver Spring Networks appreciates the opportunity to submit comments to this proceeding.

INTRODUCTION

4. Wireless Automated Metering Infrastructure ("AMI") networks have grown dramatically over the last decade as utilities worldwide have begun to deploy networks to monitor customer usage of electricity, natural gas, and water. Most wireless AMI networks operate in a mesh configuration, where an individual meter, or node, reports customer usage data to an adjacent node, which passes the data on to the next adjacent node, etc., until the data reaches a collector node attached to a broadband backhaul network, which, in turn, transmits the information to the utility data management facility. AMI networks in the US operate predominately in unlicensed frequency bands,

many in the 902-928 MHz band ("900 MHz band"), and others in the 2400-2483 MHz band ("2.4 GHz band").

5. While operations in these frequency bands are successful for many applications, especially where meters are attached externally to single family homes in dense urban and suburban neighborhoods, there are situations where the 900 MHz band and the 2.4 GHz band are not the best choices for distributed metering networks. This is particularly true where meters are located outdoors below ground level, in basements, in areas where large buildings separate meter locations, or in some suburban and rural areas where customer premises are widely separated.
6. The lower frequencies available in the TV bands tend to penetrate buildings and other obstacles more easily, to have better propagation characteristics in outdoor open spaces, and are, as a result, attractive for deployment of AMI networks in a variety of situations.

ALLOWING UNLICENSED USE OF GUARD BANDS, REMAINDER SPECTRUM, AND DUPLEX GAPS IMPROVES AMI INFRASTRUCTURE

7. Allowing unlicensed AMI devices to use guard bands, remainder spectrum segments, and duplex gaps, will support AMI deployments at lower frequencies. Utilities will then have the option to deploy AMI at lower frequencies which in turn have better propagation characteristics in geographic areas where those deployments are more effective.
8. We recommend that the rules governing unlicensed use of guard bands, remainder spectrum, and duplex gaps be similar to those provided by Part 15.247. Our particular interest revolves around AMI systems using narrow bandwidth carriers with frequency hopping to improve coexistence and interference mitigation.
9. Frequency hopping AMI networks operate with narrow channel bandwidths, typically less than 200 kHz, and low transmission duty cycles, typically 1% to 5%. Meters are interconnected using the previously described wireless mesh infrastructure. A frequency hopping meter with a 200 kHz channel bandwidth would have 25 hopping channels over the center 5 MHz of a 6 MHz guard band channel, a meter with a 100 kHz channel width would have 50 hopping channels over the same bandwidth, and so forth.
10. As a result of the narrow channel bandwidth, the low duty cycle and the use of frequency hopping, the interference profile of an AMI network is not significant in terms of co-channel blocking effects (jamming other systems operating in the same guard band). Out of band emissions are lower on an average power basis both within the guard band, and in the upper and lower frequencies adjacent to the guard band.

11. AMI networks are installed by professional installers, usually employees of the utility or of a qualified subcontractor, and are carefully managed by the utilities to achieve their economic objectives.
12. AMI network wireless nodes are installed at fixed, precisely known locations, and remain in place long after installation. If interference mitigation were necessary, user level frequency coordination in a given geographic area is possible between AMI installations and other services.
13. For all of these reasons, our recommendation is that the AMI nodes operating in guard bands, remainder spectrum, and duplex gaps be regulated in a manner similar to the Part 15.247 rules for frequency hopping systems.

CONCLUSION

14. We agree with the Commission's proposal to make the guard bands, including the remainder spectrum, available for unlicensed use as part of the creation of the 600 MHz band plan. We recommend that the Commission apply rules similar to those in Part 15.247 for operations in the guard bands and the duplex gaps. In particular, we recommend that the Commission allow unlicensed operation of frequency hopping spread spectrum devices in the guard bands, the remainder spectrum, and the duplex gaps to support deployment of AMI networks.

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